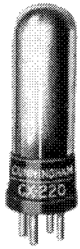
Cunningham RADIO TUBES



CX-220

POWER AMPLIFIER

The '20 is a three-electrode, high-vacuum, power amplifier tube designed for operation from dry-cells. It is intended for use in the last audio stage of dry-battery-operated receivers using the '99 and/or '22.

CHARACTERISTICS

Filament Voltage (D. C.)		3.0-3.3	Volts
Filament Current		0.125-0.132	Ampere
Plate Voltage	90	135 *max.*	Volts
Grid Voltage	−16.5	−22.5	Volts
Plate Current	3.0	6.5	Milliamperes
Plate Resistance	8000	6300	Ohms
Amplification Factor	3.3	3.3	
Mutual Conductance	415	525	Micromhos
Load Resistance	9600	6500	Ohms
Undistorted Power Output	45	110	Milliwatts
Grid-Plate Capacitance		4.1	μμf.
Grid-Filament Capacitance		2.0	μμf.
Plate-Filament Capacitance		2.3	μμf.
Maximum Overall Length			4 1/8"
Maximum Diameter			1 3/16"
Bulb (See page 42, Fig. 1)			T-8
Base			Small 4-Pin

INSTALLATION

The **base** pins of the '20 fit the standard four-contact socket. The socket should be installed to operate the tube in a vertical position. For socket connections, see page 39, Fig. 1.

The **filament** in this tube is designed for operation with three No. 6 dry-cells connected in series. In multi-tube receivers the use of six or nine No. 6 dry-cells connected in series-parallel to give 4.5 volts will decrease the current drain per cell and give a more stable source of filament power. If storage battery operation is preferred, a four-volt storage battery may be used. In any case, a filament rheostat should be provided to maintain the voltage applied to the filament within the stated range.

APPLICATION

For **power amplifier** service, the '20 will give greatest power output when operated at a plate voltage of 135 volts and the corresponding grid bias of −22.5 volts. At 90 volts on the plate and with a corresponding grid bias of −16.5 volts, good quality of reproduction may be obtained at a lower level of power output.

In receivers employing tubes of the 3.3 volt filament type, the use of the '20 in the output stage will be found desirable.